

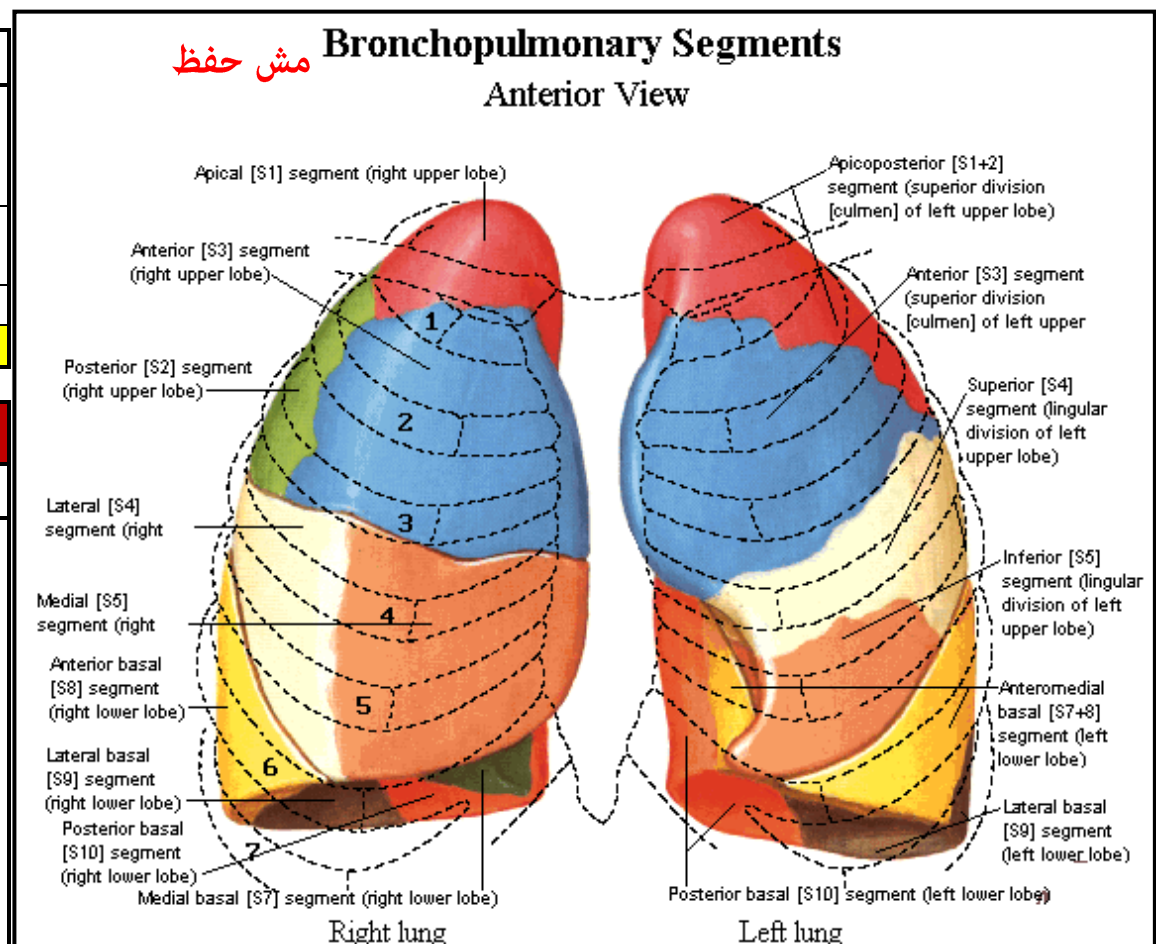
Chest Investigations & Treatment of TB .. from Dr. Ehab

* Surface Anatomy of the Lung (Lobes & Fissures) : **هام** أشعة عملي (شفوي)

Back View	Lateral View	Front View	
Mid-Line T3	Mid-Axillary Line (MXL) at 5th Rib or Space	Mid-Clavicular Line at 6th Inter-Costal Space	Greater Oblique Fissure
It's called "Greater" as it's Appear in All 3 Views			
- Mid-Line - Spinous Process of T3	- Mid-Axillary Line (MXL) 5th Rib or Inter-Costal Space	- Mid-Clavicular Line (MCL) 6th Inter-Costal Space	Surface Anatomy
The Patient Tilting his head Down - the 1 st spine appear is C7 .. then go Down	The Patient Rise his hand - the 1 st Rib to meet is 4th .. then go Down	معروفة يعني	نجيبها إزاي
	ب يقابل زميله في نفس النقطة	at 4th Rib Rt. Lung Lt. Lung Upper Lobe Middle Lobe Lower Lobe	Lesser Transverse Fissure
	- Mid-Axillary Line (MXL) 5th Rib or Inter-Costal Space	- Para-Sternal Line or Mid-Line 4th Rib	On Rt. Side ONLY
			Surface Anatomy

Rt. Lung	Lt. Lung
2 Fissures (Greater Oblique Fissure & Lesser Transverse Fissure)	1 Fissures (Greater Oblique Fissure Only)
3 Lobes (Upper, Middle & Lower)	2 Lobes (Upper & Lower)
10 Broncho-Pulmonary Segments	9 Broncho-Pulmonary Segments
Rt. Side > Lt. Side by 1 Always	

يتسألوا إزاي في العملي !؟	
1• Direct Qs .. What is the Surface Anatomy of Lung ?	
2• Examine the Middle Lobe ? - go to the 4th Inter-Costal Space on the RIGHT SIDE , then Move a little bit Lateral , then Listen by Stethoscope N.B. NEVER do it on THE LEFT SIDE or at the BACK	3• Examine the Apical Segment of Lower Lobe ? At the BACK - Patient will Sit Down , then Tilt his head Down , the 1 st spine appear is C7 .. then go Down to T3 then Listen by Stethoscope

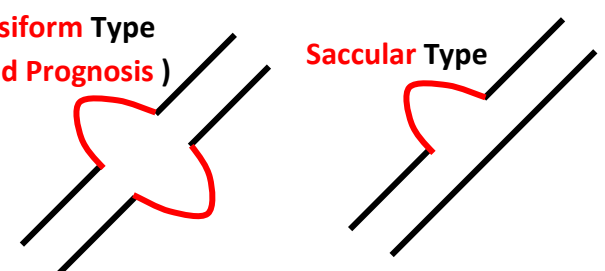


VISIT...

LANZAROTE
Caliente.COM

* Chest Investigations :					for	
■ Investigation Scheme : 1- Laboratory : • Blood • Urine & Stool • Others 2- Graph. 3- Radiological : • Plain X-ray • with Contrast • Others 4- U/S. 5- C.T. & MRI 6- Nuclear Medicine 7- Endoscopy 8- Catheter 9- Biopsy 10- Others (P.F.T.) Invasive					Complications & Function	
1 • Cor-Pulmonale : (will show Heart Failure or Rt. Vent. Enlargement) 2 • Respiratory Failure : [it's Investigation Diagnosis] * The Most Common Patient Liable to Complicate with Resp. Failure is COPD Pt. esp. Resp. Failure Type II - by H/O : History of Systemic Venous Congestion - by Examination : Rt. Sided Heart Failure Sign - by Investigation : • ✖ of Heart Failure → it's a CLINIACL Diagnosis (No Investigation) • ✔ of +++ Rt. Vent. Enlargement → ECG "but all investigation will show it" - it's Suggested Clinically by (Cyanosis, Flapping Tremors & Disturbed Conscious Level) - by Investigation : Arterial Blood Gases (ABG) * Arterial Sample ONLY .. for (Pressure O₂ , Pressure CO₂ & pH) N.B. Normal O₂ Pressure = 100% , Normal CO₂ Pressure = 40% # it's Resp. Failure when : لازم تلاقية • PO₂ ↓ to 60% (it's a MUST to Find O₂ Level ↓) = HYPOXIA مش لازم تلاقية • PCO₂ ↑ to 50% (it's Not a MUST) = HYPERCAPNIA # there are 2 Types of Resp. Failure .. - Type I (Hypoxia Only) فيه حاجة واحدة بس - Type II (Hypoxia & Hypercapnia) فيه حاجتين						
1 • T.B. 2 • Irritation 3 • Allergy [Bronchial Asthma, Asthmatic Bronchitis]					Etiology	
see Later - by H/O : Smoking, Working, But Nothing in Investigation to be Done - by H/O : the Patient will complain of Symptoms و Characterized by : • Paroxysmal Attacks • it has Precipitating Factors • it has Relieving Factors + Investigation Not Needed .. but upon Request we could do these Investigations "أي كلام كلهم" - Blood Picture : will find Eosinophilia & ↑ IgE - Sensitivity Tests						
		1 st Investigation	then	then	then	Main Diagnosis
1 • COPD		Plain X-ray	★ Pulmonary Function Tests will show Obstructive Pattern	—	—	
2 • S.L.S.	• Broncho-Ectasis	Sputum Analysis for Infection	Plain X-ray	Broncho-Graphy إذا مش شغال بـ نعمل ده	★ C.T. ± Broncho-Scope to Exclude Abscess	
	• Lung Abscess	Sputum Analysis for Infection	Plain X-ray	± Broncho-Graphy to Exclude Broncho-Ectasis	★ C.T. ★ Broncho-Scope لازم بنعمل الأثنين مع بعض	
3 • Pulmonary Fibrosis (Parenchymatous Type)		Plain X-ray	★ Pulmonary Function Tests will show Restrictive Pattern	—	—	
4 • Pleural Effusion		★ Plain X-ray بنعمل الأثنين مع بعض تثبت أنه موجود		★ Aspiration عشان تعرف طبيعته	± Pleural Biopsy	
5 • Surgery		—				

• Tuberculin Test			
[is a Skin Test that Detects Delayed Hypersensitivity (Type IV) Response to Previous Exposure of the Host to the Tubercle Bacilli] - it's one of the Main Tests used to Diagnose LATENT Tuberculosis Infection			
• Underlying Mechanism :	• as a Result of Previous Exposure of the host to Tubercle Bacilli → Th1 Cells are Sensitized, Activated & Clonally Expanded • in +ve Reactors; the Injected Tuberculin Substance Stimulate the Pre-Sensitized Th1 Cells Th1 Cells → Secrete Cytokines و Recruit Inflammatory Cells Particularly Macrophages - the Result is a Raised, Indurated Area around the Site of Injection N.B. No Reaction is seen in People who have Not been Sensitized to TB		
• Technique :	• 0.1 ml of Purified Protein Derivative (PPD) Containing 5 Tuberculin Unites (TU) is Injected Intra-Dermally in the Skin of the Anterior Aspect of the Forearm • the Result is read After 48-73 Hrs. by PALPATING for the Presence of INDURATION & Measure its Diameter (NOT the Erythema)		
• Interpretation :	Reaction have been Categorized by Different Criteria (Risk Factors) Depending on the Circumstances of the Patients		
	"5-10-15 Millimeter System"		
	5	10	15
	Indurations 5> ml.	Indurations 10> ml.	Indurations 15> ml.
	• Considered Positive for : - People who have Had TB Disease before - Close Contacts of People with Infectious TB - People with HIV Infection	• Considered Positive for : - People who in Endemic Areas where TB is Common - People with Certain Medical Conditions e.g. Diabetes - Un-vaccinated Children Younger than 4 Years Old	Considered Positive *even in Absence of Any Risk Factors
• False -ve Results :	1- Anergy: it's Inability to React to Tuberculin Test because of Weakened Immune System e.g. Severe TB Disease, HIV Infection or Cancer 2- Recent TB Infection: after exposure, it takes 2 to 10 Weeks for Tuberculin Test to become +ve		
• False +ve Results:	1- Infection with Non-Tuberculous Mycobacteria (NTM): due to Cross-Reaction with M. tuberculosis Antigens 2- Vaccination with Bacille Calmette-Gu é rin (BCG): after BCG Vaccination, Tuberculin Skin Test Remains +ve for up to 5 Years		

	± Technique		Indication تعمل لـ العيان أيه ؟!	Value هـ تبين أيه ؟!	± its Reading !؟ بيان إزاي ؟! see Para-Clinical Notes	
• Labs :						
1 • Sputum Analysis : مزرعة بلغم (it's <u>Not</u> Investigation of Choice .. but, it may be the 1st Investigation to be done)	# Analysis Aspects		العيان يبصق .. غالباً العينة هـ تكون متلوثة .. Usually the Sample will be Contaminated by Oral Commensals Bacteria إذا الدكتور سأل ما تقولهاش من نفسك we can use Broncho-Scope to get clean Samples	العيان اللي هـ أحتاج أديله مضاد حيوي • S.L.S. ONLY • COPD “when he Infected” BUT , In 90% of Cases of COPD .. the Organism is Known so, we Start Empirical ttt With OUT Sputum Analysis # when we do a Sputum Analysis for COPD Patient ?! • if Empirical ttt Failed • if it's Associated with Broncho-Ectasis	—	
	a • Macroscopic	- Physical Properties - Chemical Analysis				
	b • Microscopic	- Cells - Organisms				
	c • Culture & Sensitivity					
2 • Serous Aspirate Analysis : For Pleural Fluid	• via Thora-Centesis.. (we insert the Needle ABOVE the Rib to Avoid Injury of the Intercostal Nerve) Then, do Analysis for the Aspirated Fluid as previous mentioned in sputum analysis		• Pleural Effusion	# by X-ray we will Diagnose the Pleural Effusion .. but we do Aspiration to Categorize the Effusion (Transudation, Exudation, Chylous & Malignant) See next page		
3 • Sweat Analysis : تقولها لما الدكتور يسألك	• give the Patient “ Pilocarpine ” to make him Sweat		• Cystic Fibrosis .. as it present as S.L.S.	—		
• Radiological :						
4 • Plain X-ray :	مؤجل		• All Chest Cases	For each Disease there's a Certain Pattern • in Pleural Effusion it's the Invest. Of Choice - in Postero-Anterior View & - in Lateral View for Minimal Effusion		
5 • Contrast *هام (Broncho-Graphy) : ب ينزل في اللجنة ك أشعة N.B.	# المادة ما هي ؟!		• S.L.S. especially Broncho-Ectasis - It was the Investigation of Choice until the C.T. has been Discovered	• Confirm the Diagnosis .. as X-ray could Miss the Diagnosis • Determine the Type of Broncho-Ectasis .. Fusiform Type (Bad Prognosis) Saccular Type • Determine the Site (و Segment) العلاج		
	✗ Lipidol (contain Iodine)	✓ Hytrast (و Now Used)				
	• Iodine Sensitivity • Fat Soluble → Fat Embolism	• Free of Iodine • Water Soluble				
	# ما هي طريقة إدخالها ؟!					
	via Broncho-Scope .. with Anesthesia					
	# أيه هي مشاكلها ؟!					
	1- Iodine Allergy 2- Anesthesia Complication	3- Fat Embolism 4- Spread of Infection in Acute Attack				
6 • C.T. :	مؤجل		• S.L.S. for both (Abscess & Broncho-Ectasis) * but for Broncho-Ectasis as the lesion is too Small, we use High Resolution C.T. (HRCT) with Minimal Thickness Cut (but it's Much More Expensive) • Interstitial Pulmonary Fibrosis	—		
7 • Endoscope = Broncho-Scope : هام جداً شفوي* “there are 2 Types : Rigid & Fibro-Optic (Flexible) ”	# What is the Indication for Broncho-Scope ?! شفوي		• S.L.S. especially Lung Abscess	# What are the Value in Lung Abscess ?! • to Visualize the Lesion • to Take a Biopsy (as 50% are Malignant) • to Remove F.B. (it's usually the Cause of Abscess)		
	Diagnostic	1• to Visualize the Lesion 2• to Take a Biopsy				From Lesions in Endothelium Lining Bronchi [Endo-Bronchial] e.g. Bronchogenic Carcinoma
		± Broncho ALVEOLAR Lavage (BAL) via Injection of Saline a wash the Alveoli .. the aspirate the wash and Analysis it				
		Therapeutic				1• Removal of F.B. or Mucus Plug 2• to Insert Medications : Antibiotics or Cyto-Toxic Drugs
± to Stop Severe Hemoptysis						
8 • P.F.T.	See next page					

Pulmonary Function Tests (P.F.T.) مهم جداً جداً

■ What's The Pulmonary Function ?!		مقياس التنفس Spirometer		for Accurate Diagnosis
1- Ventilation : the Air Enter the Lung Almost the Disease affect this Function → ↓ (Hypo-Ventilation) .. either • الدُّنْيَا مسدودة Obstructive e.g. COPD • مش قادر أفتح Restrictive e.g. Fibrosis & Effusion		• the Results will be express as a Graph (Spiro-Graph)		
2- Diffusion : the Air Enter the Alveoli		1 • Forced Vital Capacity (FVC) [Volume of Air Expired by Max. Expiration following Max. Inspiration]		
3- Perfusion : the Air exchange with Blood		2 • Forced Expiratory Volume in 1st Second (FEV₁) .. it Depends on Diameter of Airway (as Diameter ↑ → ↑ FEV ₁) [Volume of Air that has been Exhaled at the End of the 1 st sec. of Forced Expiration]		
* Indications :		3 • Forced Expiratory Ratio (FER) = FEV₁/FVC ... * in COPD , FER will ↓		for Follow-up
• COPD , Fibrosis		N.B. Spirometer is Expensive & Need an Expert Doctor to Do it , so we Do it Once for Accurate Diagnosis & Determination of the Treatment .. then change into (Follow up Tests)		
* Value :				
• to Know the Nature of Lesion (Obstructive, Restrictive or Mixed)				
• to Know the Degree of Lesion via % of FER (Prognostic Value)				for Bed Side Tests
• to Determine the Reversibility of Lesion (e.g. in case of Broncho-Spasm .. do the test (FEV ₁) .. then give the Patient Broncho-Dilator .. then Repeat the test (FEV ₁) if it's Improved → it's Reversible Lesion)				
N.B. we have to Determine the Reversibility of Lesion as we will Treat the Patient with a Drug for Life which has also a Side Effect .. so we need to Know if this Drug is Beneficial or Not				
		Peak Expiratory Flow Rate (PEFR) أسم الإختبار Peak Flow Meter أسم الجهاز		for Follow-up
		بـ يقيس معدل خروج الهواء في وحدة الزمن		
		لـ أنه الجهاز لما العيان ينفخ فيه المؤشر هـ يعلى لـ مستوى معين .. بس لما العيان يشيل بوقه من الجهاز .. المؤشر هـ يفضل مكانه في أعلى نقطة وصلها (إلا إذا العيان داس على زرار في الجهاز ورجعه لـ الصفر)		
		Peak		
.. it Depends on Diameter of Airway (as Diameter ↑ → ↑ PEFR) .. & as the +++ PEFR .. this mean that the Patient Condition is Improve		Flow Meter		for Follow-up
* Technique :		Peak		
• 1 st patient should take a 3 repetitive Respirations .. then he Expired the Air				
★ N.B. NOW .. the New Classification of Bronchial Asthma is Depend on (PEFR)				
				for Follow-up
				
Match Test “very Famous but Not Accurate” الكبريت		Forced Expiratory Time (FET) “very Accurate”		for Bed Side Tests
بـ تشوف العيان يقدر يطفي عود الكبريت من على بعد كام سم ..		بـ نخلي العيان يطلع نفس جامد		
* بس خلي بالك : العيان لازم يكون فاتح بوقه جامد ..		& the Doctor put the Stethoscope on the Trachea by Stopwatch : Determine the Time for Expiration (as the Time +++ > 5 Sec. .. this = OBSTRUCTION)		
عشان ما يستخدمش عضلات بوقه في النفخ .. إحنا عايزين الهواء اللي خارج من الرئة بس		N.B. the Results of this Test is Comparable to the Results of Spirometer		
* if Patient Can NOT Snuff Out the Match from a Distance < 15 Cm. .. this = OBSTRUCTION		الأفضل ليك أنك تعمل الإختبار ده ع الحالة من قبل ما يتطلب منك (منظر كقدام الدكتور وكدره يعني) 🏥		

N.B. Nowadays, TB is HOME Treatment Only زمان كان في المُستشفيات		
Indication of Administration into Hospitals are :	1• Severe Pulmonary TB 2• Immuno-Compromised Patients 3• Resistant Cases	
طريقة إعطاء الدواء	• Non-Supervision Therapy (NST)	ب ندي العيان الدواء كل شهر .. وهو ياخده لوحده من غير ما حد يشرف عليه عيبه : أنه ممكن العيان ينسي ياخذ الدواء .. أو يبيع الدواء
	• Direct Observation Therapy (DOT)	في واحد ب يروح لـ العيان كل يوم يديله الدواء ويتأكد أنه أخذ الدواء عيبه : أنه لازم تُوفر موظف يعدي ع العيان كل يوم يديله الدواء
جُرعات الدواء	• Continuous Daily Dose	يومياً
	• Intermittent Weekly Dose	مرتين في الأسبوع (ب تجيب نفس النتائج + أسهل)
* Multi-Drug Resistant TB (MDR-TB) :		
• Definition :	[it's a TB ʁ Resistant to Both Rifampicin & INH]	
• Types :	• 1ry : from the Start the Patient is Infected with a Resistant Strain	
	• 2ry : Patient is Infected with Normal Strain .. but it Develop a Resistant with time	
• Risk Factors :	• Faulty Treatment e.g. the doctor start ttt with Only 1 Drug <u>or</u> Patient did not take the drugs • Doctors & Medical Students	
• Diagnosis :	• ✓✓ via Culture & Sensitivity : ده الصح	
	• في مصر مش ب نعمل كده .. مع الأسف ب نبدأ العلاج ع طول .. وإذا العيان ما أستجابش ليه بعد شهور .. ب نشخص !	
• Treatment :	- 24 Months Continuous - Pyrazinamide + Quinolones " (ده اللي عليه خلاف في الأبحاث) :	(N.B. absolutely we will not giving Rifampicin & INH)

N.B. nowadays .. there's a New term called **Extreme-Drug Resistant TB (XDR-TB)** [it's a TB ʁ Resistant to All Drugs]

